

# NASA TECH BRIEF



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## Computerized Schedule Effectiveness Technique (SET) Determines Present and Future Schedule Position

### The problem:

To devise a computerized scheduling system that produces a single index of current schedule performance which can also be projected as an indicator of future performance.

### The solution:

A program which calculates an index of overall schedule effectiveness. The schedule-effectiveness index is a measurement of actual overall performance against the existing schedule, and a series of schedule-effectiveness values indicates the trend of actual performance. This program provides management with an indication of the effectiveness of its organization, with a statistically reliable prediction of future schedule performance, and with an evaluation of tradeoffs involved in scheduling changes resulting from the incorporation of additional tasks or from other schedule adjustments.

### How it's done:

SET can be effectively utilized on any program of sufficient duration to require a predictive indicator of schedule performance; i.e., approximately one year or more in length. It uses as inputs the scheduled completion date, activity flow time, and actual completion date of all activities present in the scheduling system. These inputs can be derived from a PERT or equivalent automated input system.

SET uses this information to compare scheduled completion rates with actual completion rates. This comparison provides a single index of the overall schedule performance resulting from a variety of causes, such as efficiency, scheduling, and manpower application. The index is derived as follows. Any schedule plan is composed of a set of activities, each

of which has a specific time span associated with it. Since some activities are short and others long, a simple comparison of the rate of activity completion is inadequate, because short activities would count as heavily as long activities. The common unit of measurement for the activity is defined as a "flow-week"; consequently, each activity is weighted by its estimated duration in weeks. Thus, an activity with an estimated duration of ten weeks is weighted twice as heavily as one of five weeks. Each activity has a demand date, which must be met to achieve an "on-schedule" position. The median scheduled completion date of all incomplete activities in today's schedule is established. This date is compared to the average completion date derived from the actual rate of flow-week completions to provide the overall program schedule position, which is reduced to the schedule-effectiveness index. The index is a composite indication of the overall schedule resulting from all schedule position variables.

The trend of the observed schedule positions follows an exponential improvement curve after initial program stability has been established. Under certain circumstances, this trend can be projected to ascertain future schedule performance. Prediction intervals for the projections provide the probabilities associated with the future positions.

### Notes:

1. This program is written in Fortran IV for use on the IBM 7094 computer or the IBM 7040-7094 direct-couple system with 32,000-word memory and two tape channels.

(continued overleaf)

2. Inquiries concerning this program may be made to:

COSMIC  
Computer Center  
University of Georgia  
Athens, Georgia 30601  
Reference: B67-10522

**Patent status:**

No patent action is contemplated by NASA.

Source: D. Ballard, J. Birdsong, and R. Calva  
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